

Please cancel claim 1 and add claims 18-61.

Amendment to the Claims:

1-15. (cancelled)

16. (currently amended) A multiple fluid mixture dispensing device for mixing one or more of a plurality of liquid concentrates with one or more liquid diluents, the multiple mixture fluid dispensing device, comprising:

two or more concentrate flow control valves, each concentrate valve for controlling flow of a concentrate liquid in a ~~down stream~~ downstream direction from an inlet to an outlet thereof, one or more diluent flow control valves, each for controlling flow of a diluent liquid in a ~~down stream~~ downstream direction from an inlet to an outlet thereof,

each concentrate and diluent valve having a housing body defining a flow passage extending ~~there through~~ therethrough from the inlet thereof to the outlet thereof, and the flow passage having a flow control portion defined by a flow orifice, flow orifice sidewalls, and one or more grooves formed in the flow orifice ~~sidewall~~ sidewalls, and the one or more grooves having a cross-sectional area that decreases in a downstream direction along the flow orifice ~~sidewall~~ sidewalls, a rod extending through the housing and into and substantially coextensive with the flow passage and the rod linearly moveable by a linear drive means, and the rod having a distal end portion opposite from the linear drive means for insertion into the flow orifice and the

rod distal end portion having exterior sidewalls sized to lie closely adjacent the flow orifice sidewalls and the distal end portion for cooperating with a seat means positioned downstream of the flow passage control portion to prevent liquid flow through the flow passage when the rod is moved to a fully extended position by the linear drive means and the rod also moveable thereby to a fully retracted position for permitting maximum liquid flow and the linear drive means for holding the rod distal end portion at a plurality of positions along the one or more grooves for regulating the flow rate of the liquid as a function of the cross-sectional area of the one or more grooves, the outlets of the two or more concentrate valves and of the one or more diluent valves extending to a common nozzle.

17. (previously presented) The device as defined in claim 16, and the two or more concentrate control valves and the one or more diluent control valves comprising a common module.

18. (new) A beverage dispenser comprising;
a dispense nozzle;
a diluent valve for fluid coupling a supply of diluent for flow to said dispense nozzle;
at least two concentrate valves, each having for fluid coupling an associated supply of concentrate to said dispense nozzle;
a controller;

a plurality of fluid flow sensing means, each for sensing fluid flow through an associated one of said valves and each coupled to said controller for providing to said controller indications of fluid flow through said valves; and

a plurality of valve operating means, each controllable to progressively operate an associated one of said valves between a valve closed position and a valve open position and all positions therebetween to provide selected fluid flows through said valves,

said controller being coupled to said plurality of valve operating means to control the same to progressively operate said diluent valve and a selected one of said concentrate valves to deliver flows of diluent and concentrate to said dispense nozzle, said controller, in response to indications of the sensed flows of concentrate and diluent through the operated valves, controlling at least one of said valve operating means associated with the operated valves in accordance with diluent to concentrate fluid flow ratios to be delivered through the operated valves to said dispense nozzle.

19. (new) A beverage dispenser as in claim 18, wherein said controller, in response to indications of the sensed fluid flows through the operated valves, controls said valve operating means associated with each of the operated valves to control fluid flows through the operated valves in accordance with diluent to concentrate fluid flows to be delivered to said dispense nozzle.

20. (new) A beverage dispenser as in claim 18, wherein said controller, in response to indications of the sensed fluid flows through the operated valves, controls said valve operating means associated with said diluent valve to control diluent flow

through said diluent valve in accordance with diluent to concentrate fluid flow ratios to be delivered to said dispense nozzle.

21. (new) A beverage dispenser as in claim 18, wherein said controller, in response to indications of the sensed fluid flows through the operated valves, controls said valve operating means associated with said operated concentrate valve to control concentrate flow through said operated concentrate valve in accordance with diluent to concentrate fluid flow ratios to be delivered to said dispense nozzle.

22. (new) A beverage dispenser as in claim 18, wherein said plurality of fluid flow sensing means comprises a plurality of fluid flow rate sensing means.

23. (new) A beverage dispenser as in claim 18, wherein said plurality of fluid flow sensing means comprises a plurality of fluid volumetric flow sensing means

24. (new) A beverage dispenser as in claim 18, wherein at least one of said plurality of valve operating means comprises a stepper motor.

25. (new) A beverage dispenser as in claim 20, wherein at least one of said stepper motors are of the pulsed, magnetically driven type.

26. (new) A beverage dispenser as in claim 18, wherein at least one of said plurality of valve operating means comprises a proportional solenoid actuator.

27. (new) A beverage dispenser as in claim 18, wherein at least one of said plurality of valve operating means comprises a diaphragm operated mechanism.

28. (new) A beverage dispenser as in claim 18, wherein said plurality of valve operating means comprises the sole means for operating said diluent and concentrate valves.

29. (new) A beverage dispenser as in claim 18, wherein each said diluent and concentrate valve includes a fluid flow passage and a flow control member movable in said fluid flow passage from a first position in which the valve is fully closed to a second position in which the valve is fully open and to all positions therebetween, said flow control member progressively controlling the degree of opening of the valve to flow of fluid therethrough as it moves from said first to said second position, said plurality of valve operating means each being coupled to the flow control member of its associated valve for moving the flow control member to provide selected fluid flows through said valves.

30. (new) A beverage dispenser as in claim 29, wherein each said diluent and concentrate valve includes one or more grooves in its fluid flow passage that have a cross-sectional area that decreases in a downstream direction along the flow passage, said plurality of valve operating means, when moving a flow control member of a valve, causing fluid to flow through the one or more grooves in the flow passage and controlling the flow of fluid through the valve by adjustably controlling the cross-sectional area of the one or more grooves through which fluid flows.

31. (new) A beverage dispenser as in claim 30, wherein said at least one groove is of tapering V-shape.

32. (new) A beverage dispenser as in claim 18, wherein at least one of said plurality of fluid flow sensing means comprises a flow turbine.

33. (new) A beverage dispenser as in claim 18, wherein said fluid flow sensing means for said at least two concentrate valves comprises flow turbines.

34. (new) A beverage dispenser as in claim 18, wherein said flow sensing means for said diluent valve comprises a flow turbine.

35. (new) A beverage dispenser as in claim 18, wherein each of said fluid flow sensing means comprises a flow turbine.

36. (new) A beverage dispenser as in claim 18, wherein at least one of said diluent and concentrate valves comprises a housing having an inlet, an outlet, a fluid flow passageway extending between said inlet and outlet, and a closure member adjustably movable in said passageway by the associated valve operating means from a first position of said closure member in which said valve is closed to a second position in which said valve is open and to all positions therebetween to control, by movement of said closure member, the degree of opening of said valve.

37. (new) A beverage dispenser as in claim 36, wherein in said first position said closure member engages a wall of said passageway to seal said passageway and one of said wall of said passageway and said closure member define at least one groove having a transverse cross-sectional area that decreases in the downstream direction, whereby movement of said closure member from said first position toward said second

position opens a cross-sectional flow area through said at least one groove that increases in accordance with the extent of movement of said closure member.

38. (new) A beverage dispenser as in claim 37, wherein said at least one groove is of tapering V-shape.

39. (new) A beverage dispenser as in claim 18, wherein at least one of said diluent and concentrate valves comprises a housing having an inlet, an outlet, a passageway between said inlet and outlet, a seat in said passageway and a poppet adjustably movable in said passageway by said associated valve operating means from a first position in which said poppet is moved against said seat and said valve is closed to a second position in which said poppet is moved away from said seat and said valve is open and to all positions therebetween to control the degree of opening of said valve.

40. (new) A beverage dispenser as in claim 18, wherein said at least two concentrate valves comprise at least four concentrate valves and including a second diluent valve, said plurality of fluid flow sensing means sensing fluid flow through said second diluent valve and said plurality of valve operating means operating said second diluent valve, said controller progressively operating a selected one of said diluent valves and a selected one of said concentrate valves to deliver flows of diluent and concentrate to said dispense nozzle.

41. (new) A beverage dispensing system, comprising:
diluent and concentrate supply lines; and
a flow control assembly for connection with supplies of diluent and concentrate:

connections for connecting with said diluent and concentrate supply lines,
a first valve for controlling the flow rate of the diluent,
a second valve for controlling the flow rate of the concentrate selected from among a plurality of concentrates,
means for identifying the selected concentrate,
a first sensor used to determine an actual flow rate of the diluent from said first valve,
a second sensor used to determine an actual flow rate of the concentrate from said second valve, and
a controller for controlling said first and second valves based on an identification of the selected concentrate and information received from said first and second sensors,
wherein based on an identification of the selected concentrate, said controller determines a concentrate flow rate of the selected concentrate and a ratio of the flow rates of the diluent and concentrate, thereby determining a diluent flow rate of the diluent, said controller controlling said first valve to dispense the diluent at the diluent flow rate and controlling said second valve to dispense the concentrate at the concentrate flow rate.

42. (new) A beverage dispensing system as in claim 41, said first valve including a first valve member for controlling the flow rate of the diluent, said second valve including a second valve member for controlling the flow rate of the concentrate, said controller moving said first and second valve members between valve closed positions and valve open positions and all positions therebetween based on information from said first and second sensors, wherein based on an identification of the selected concentrate, said controller determines a concentrate flow rate

of the selected concentrate and a ratio of the flow rates of the diluent and concentrate, thereby determining a diluent flow rate of the diluent, said controller controlling said first valve member to dispense the diluent at the diluent flow rate and controlling said second valve member to dispense the concentrate at the concentrate flow rate.

43. (new) Apparatus for dispensing a beverage, comprising:

means for flowing diluent to a dispensing nozzle;

means for flowing concentrate to said dispensing nozzle;

means for sensing the flows of the diluent and concentrate to said dispensing nozzle;

and

means, responsive to said sensing means, for controlling the flow of at least one of the diluent and concentrate for all flows of the same from zero flow to a maximum flow and all flows therebetween, to control the ratio of the flows of diluent and concentrate to said dispensing nozzle.

44. (new) Apparatus as in claim 43, wherein said means for controlling the flow of at least one of the diluent and concentrate controls the flow of the diluent.

45. (new) Apparatus as in claim 43, wherein said means for controlling the flow of at least one of the diluent and concentrate controls the flow of the concentrate.

46. (new) Apparatus as in claim 43, wherein said means for controlling the flow of at least one of the diluent and concentrate controls the flow of both the diluent and concentrate.

47. (new) Apparatus as in claim 43, wherein said means for flowing diluent to said dispensing nozzle comprises means for flowing one of at least two diluents to said dispensing nozzle and said means for flowing concentrate to said dispensing nozzle comprises means for flowing one of at least four concentrates to said dispensing nozzle.

48. (new) A method of dispensing a beverage, comprising the steps of:
flowing diluent to a dispense nozzle;
flowing concentrate to the dispense nozzle;
sensing the flows of diluent and concentrate to the dispense nozzle;
controlling, in response to said sensing step, at least one of said flowing steps for all flows of diluent and concentrate progressively from a zero flow to a maximum flow and all flows therebetween to provide a desired flow ratio of diluent and concentrate to the dispense nozzle.

49. (new) A method as in claim 48, wherein said controlling step controls the flow of the diluent to the dispense nozzle.

50. (new) A method as in claim 48, wherein said controlling step controls the flow of the concentrate to the dispense nozzle.

51. (new) A method as in claim 48, wherein said controlling step controls the flow of both diluent and concentrate to the dispense nozzle.

52. (new) A method as in claim 48, wherein said step of flowing diluent flows a selected one of two diluents to the dispense nozzle and said step of flowing concentrate flows a selected one of at least four concentrates to the dispense nozzle.

53. (new) A method as in claim 48, wherein said flowing diluent step comprises flowing diluent through a diluent valve to the dispense nozzle, said flowing concentrate step comprises flowing concentrate through a concentrate valve to the dispense nozzle, said sensing step comprises sensing the flows of diluent and concentrate through the diluent and concentrate valves, and said controlling step comprises controlling, in response to said sensing step, a flow path through at least one of the diluent and concentrate valves progressively for all flows through the valve from zero flow to a maximum flow and all flows therebetween to control the ratio of the flows of diluent and concentrate to the dispensing nozzle.

54. (new) A method as in claim 53, wherein said controlling step controls the flow path through the diluent valve.

55. (new) A method as in claim 53, wherein said controlling step controls the flow path through the concentrate valve.

56. (new) A method as in claim 53, wherein said controlling step controls the flow path through each of the diluent and concentrate valves.

57. (new) A method as in claim 48, wherein said sensing step senses the actual flow rates of diluent and concentrate to the dispense nozzle.

58. (new) A method of dispensing a beverage, comprising the steps of:
fluid coupling diluent through a diluent valve to a dispense nozzle;
fluid coupling concentrate through at least two concentrate valves to the dispense nozzle;

sensing fluid flows through each of the diluent and concentrate valves;

coupling a plurality of valve operators to individual associated ones of the diluent and concentrate valves to operate the valves progressively to all states between a first state in which the valve is closed position and a second state in which the valve is fully open;

controlling the valve operators to operate the diluent valve and a selected one of the concentrate valves to flow diluent and concentrate to the dispense nozzle and, in response to said sensing step, controlling at least one of the valve operators associated with the operated valves to control the flow of fluid through the associated valve in accordance with and to provide a target diluent to concentrate flow ratio to be flowed to the dispense nozzle.

59. (new) A method of dispensing a beverage, said method comprising the steps of:

selecting a concentrate from among plural concentrates;

determining a target ratio of diluent and concentrate flow rates based on information corresponding to the selected concentrate;

determining an actual flow rate of the diluent;

determining an actual flow rate of the concentrate;

controlling the actual flow rates of the diluent and concentrate progressively for all flow rates of the same from a zero flow rate to a maximum flow rate; and

if the actual flow rates of the diluent and the concentrate do not satisfy the target ratio for diluent and concentrate flow rates, controlling the actual flow rate of at least one of the diluent and the concentrate to satisfy the target ratio.

60. (new) A method as in claim 59, wherein said controlling step controls the actual flow rate of the diluent to satisfy the target ratio.

61. (new) A method as in claim 59, wherein said controlling step controls the actual flow rate of the concentrate to satisfy the target ratio.

61. (new) A method as in claim 59, wherein said controlling step controls the actual flow rates of each of the diluent and concentrate to satisfy the target ratio.